

MODULE 27105

FLOOR SYSTEMS

(27105 LESSON 2a)

SLIDE PRESENTATION

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4.0.0 The Floor System

- The floor system is the base that the remainder of the structure rests on.
- Key components of the floor system include the sill plate, joists, girders, bridging, and subfloor.

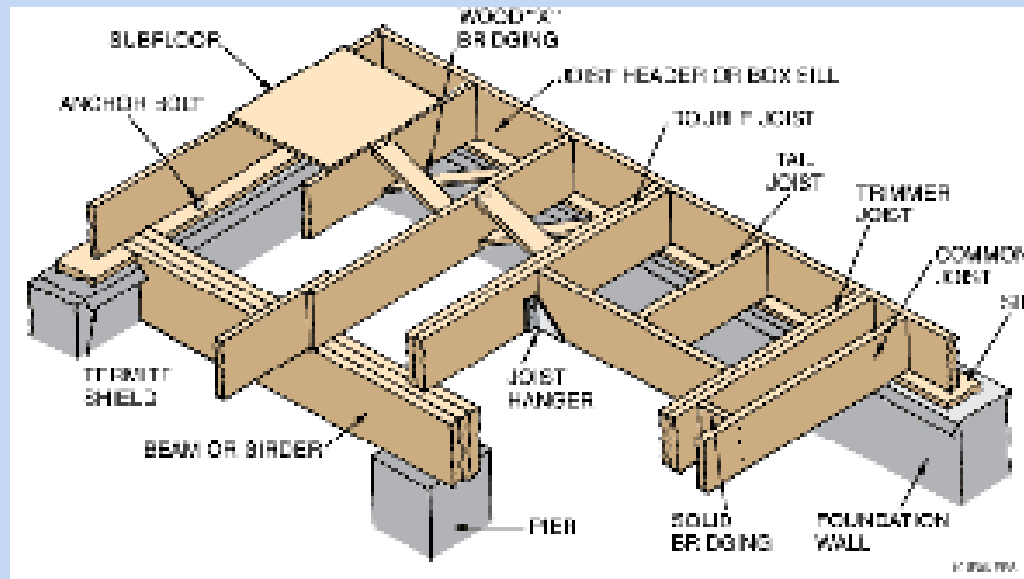
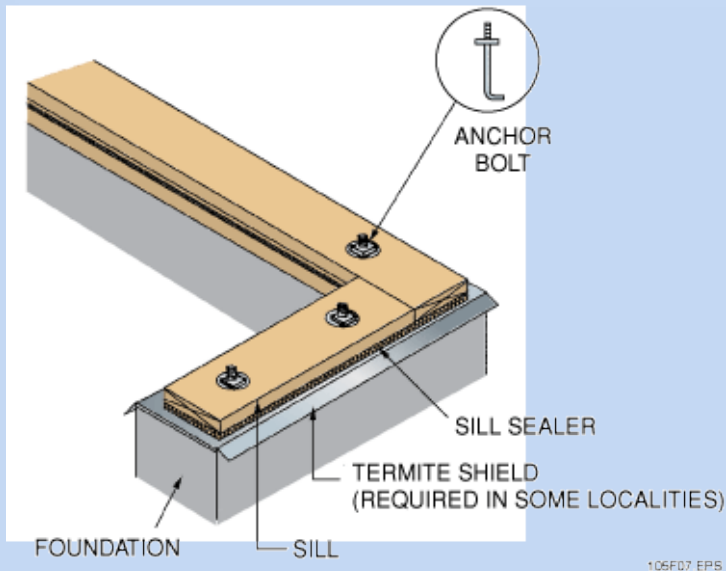


Figure 6 Typical platform frame floor system.

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4.0.0 The Floor System

- The sill plate, which is usually made of 2×6 pressure-treated lumber, is attached to the foundation, generally by using anchor bolts.
- A termite shield is often placed between the sill and the foundation. A sill sealer may also be used.



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Figure 7 Typical sill installation.



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SLIDE 10

4.0.0 The Floor System

- Straps are sometimes used to attach the sill to the foundation.

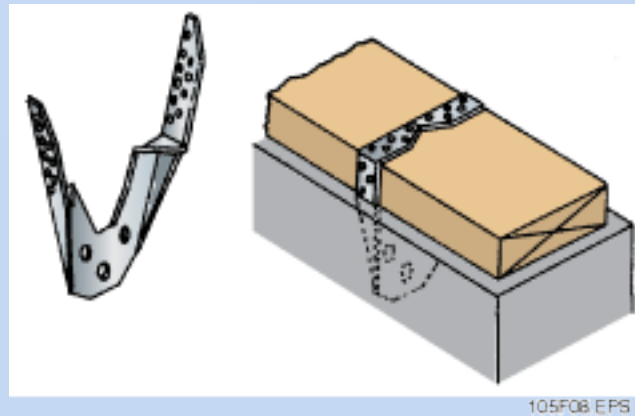


Figure 8 Typical sill anchor strap.

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4.0.0 The Floor System

- Girders are used to support joists when a single joist cannot cover the entire floor span.
- Girders are made of a variety of materials, including solid lumber, engineered lumber, built-up lumber, and steel beams.
- Built-up girders do not warp as easily as solid lumber, but cannot carry as large a load.
- Steel beams are used when there are few or no piers or interior supports. They can support a larger load with a smaller beam, which allows greater headroom in a basement or crawlspace.

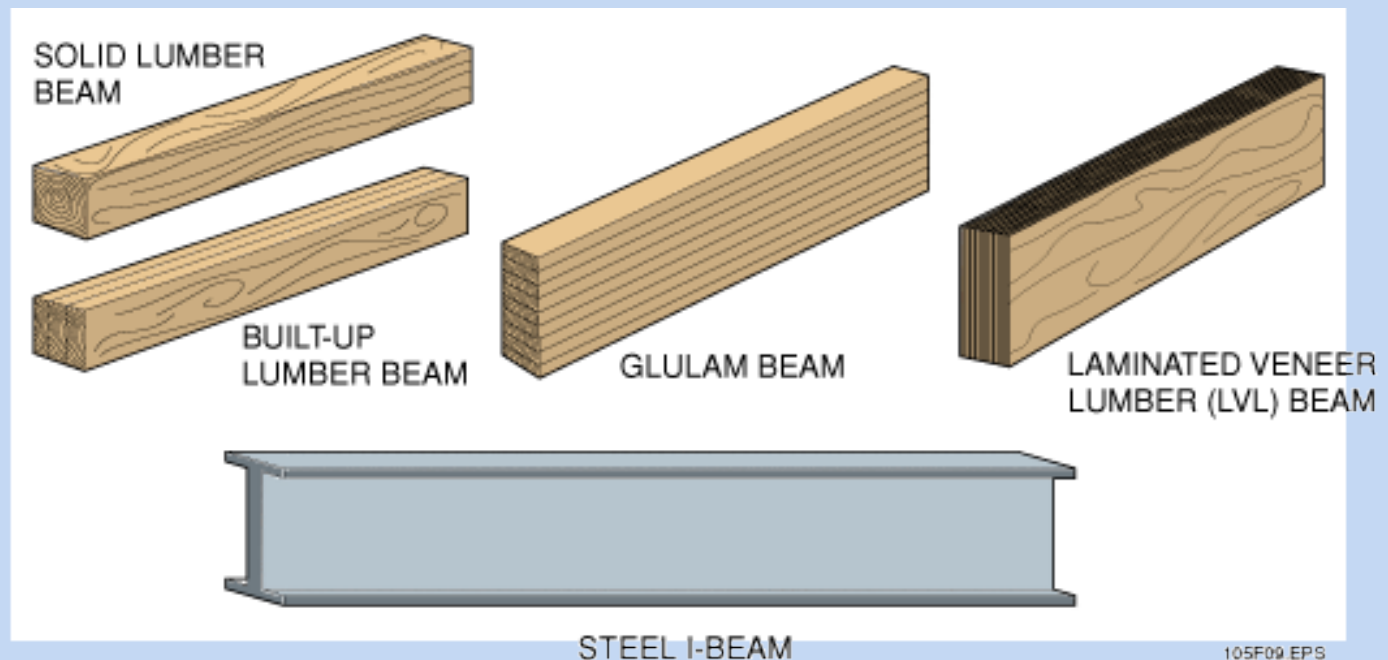


Figure 8 Typical sill anchor strap.

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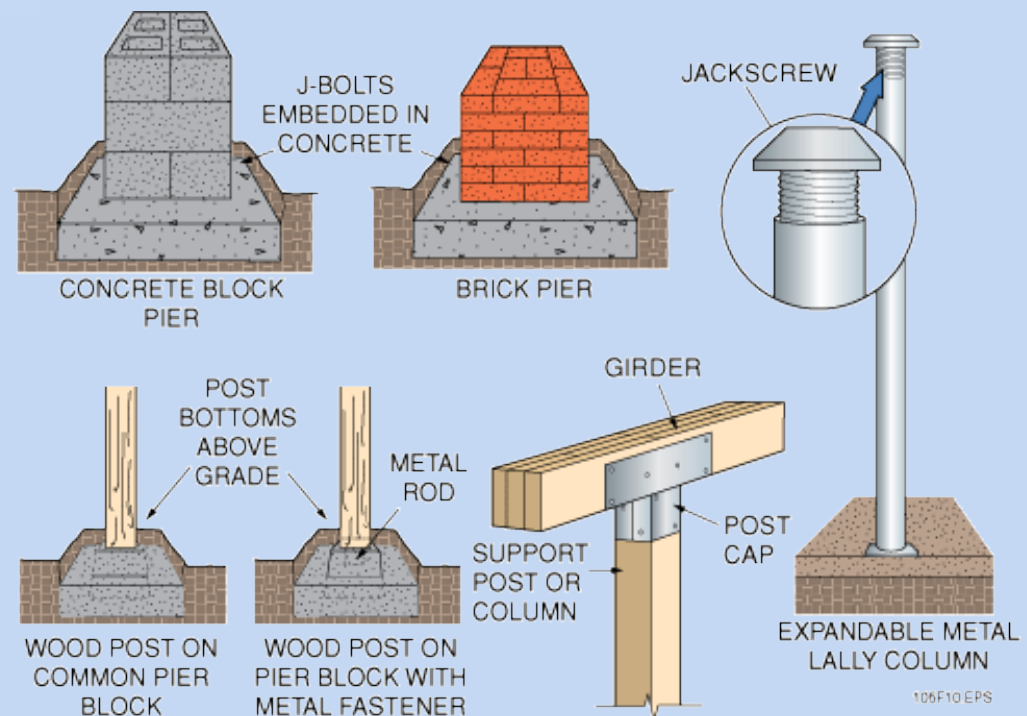
4.0.0 The Floor System

- Girders and beams must be supported by piers, posts, or column, both at the foundation walls and at intervals between.
- Solid or built-up wood posts on pier blocks are commonly used.



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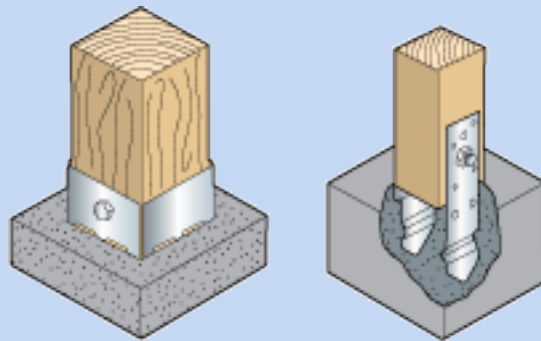
Figure 10 Typical methods of supporting girders.



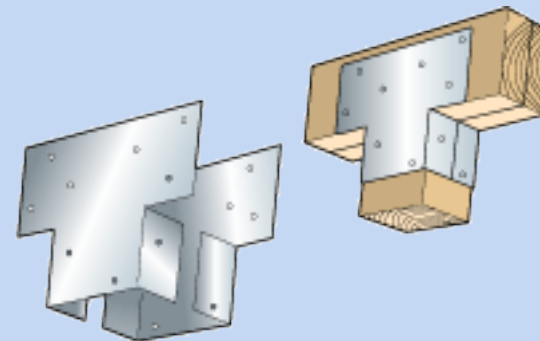
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4.0.0 The Floor System

- Post anchors and caps are also popular methods of supporting girders.



POST ANCHORS



POST CAPS

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Figure 11 Typical post anchors and caps.

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4.0.0 The Floor System

- Local codes determine spacing between supports. The farther apart the supports, the larger the girder must be.

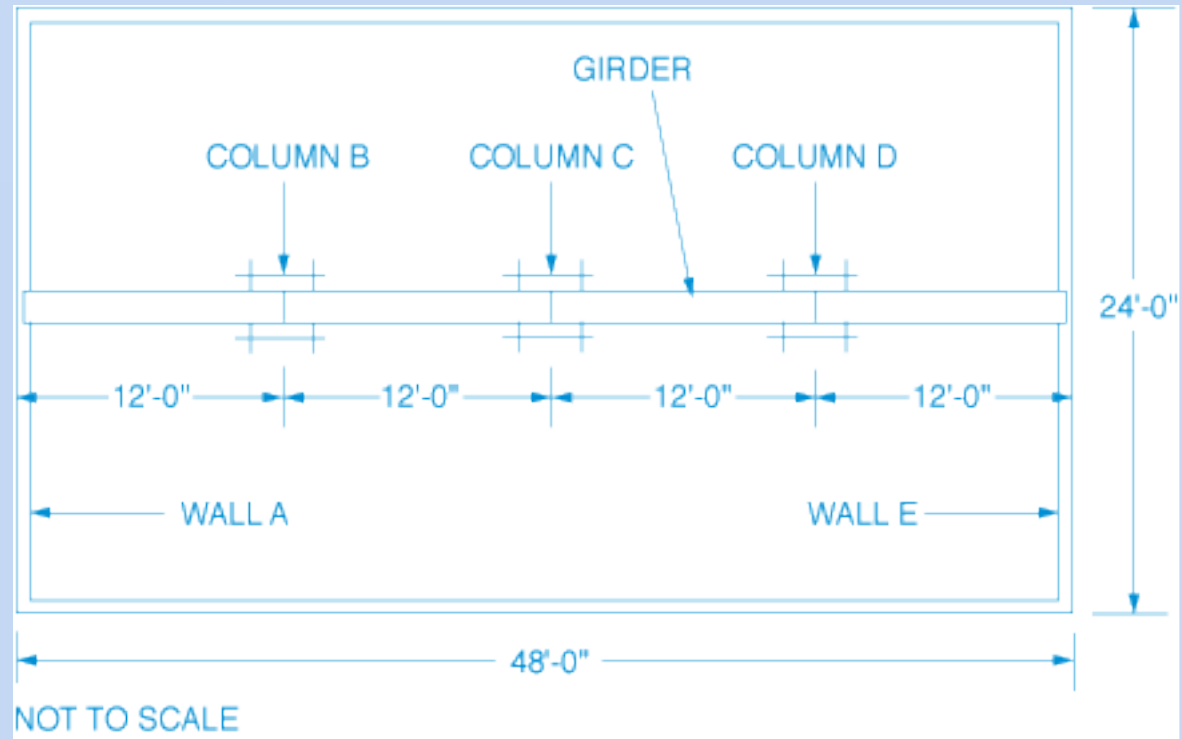


Figure 12 Example of column spacing.

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4.0.0 The Floor System

- Support of girders at the foundation walls can be done using posts or piers.

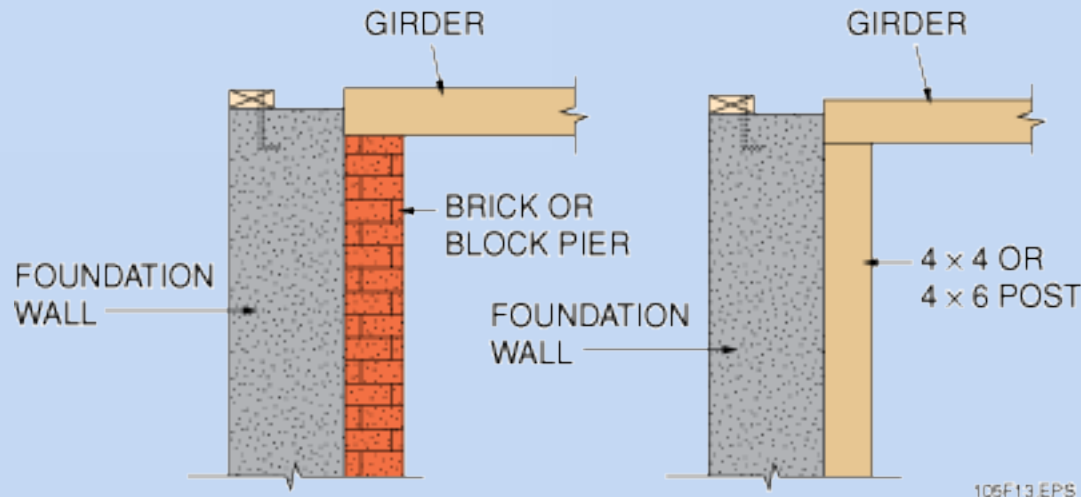
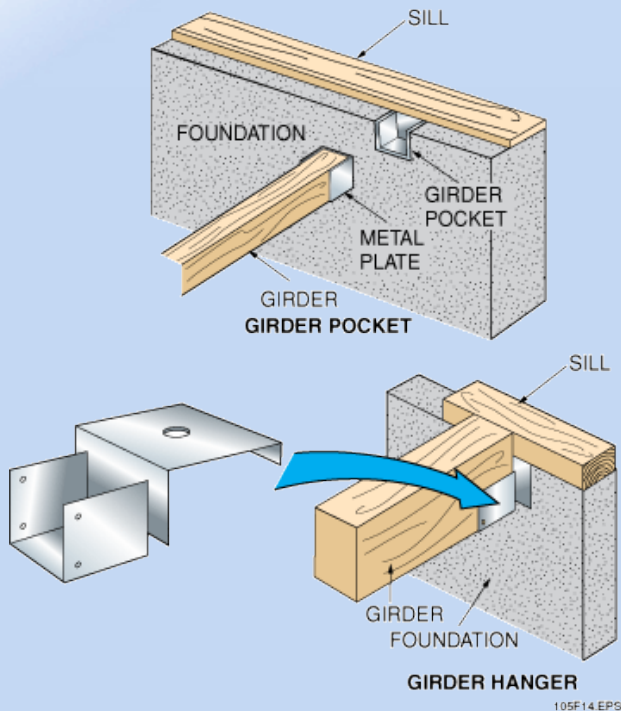


Figure 13 Post or pier support of a girder at the foundation wall.

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4.0.0 The Floor System

- Pockets built into the wall are also used as girder supports. The pocket should be at least one inch wider than the girder and the girder must have at least 4 inches of bearing on the wall. Girder hangers are sometimes used.



[Click here to watch video.](#)

Figure 14 Girder pocket and girder hanger girder supports.

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4.0.0 The Floor System

- Floor joists rest on and transfer the building load to the sill plate and foundation.
- A rule of thumb for calculating load is 50 pounds per square foot, including 10 pounds of **dead load** and 40 pounds of **live load**.
- Joists are usually installed 16 inches on center with the crown up. However, spacing can range from 12 inches to 24 inches in increments that accommodate four-foot sheet material.

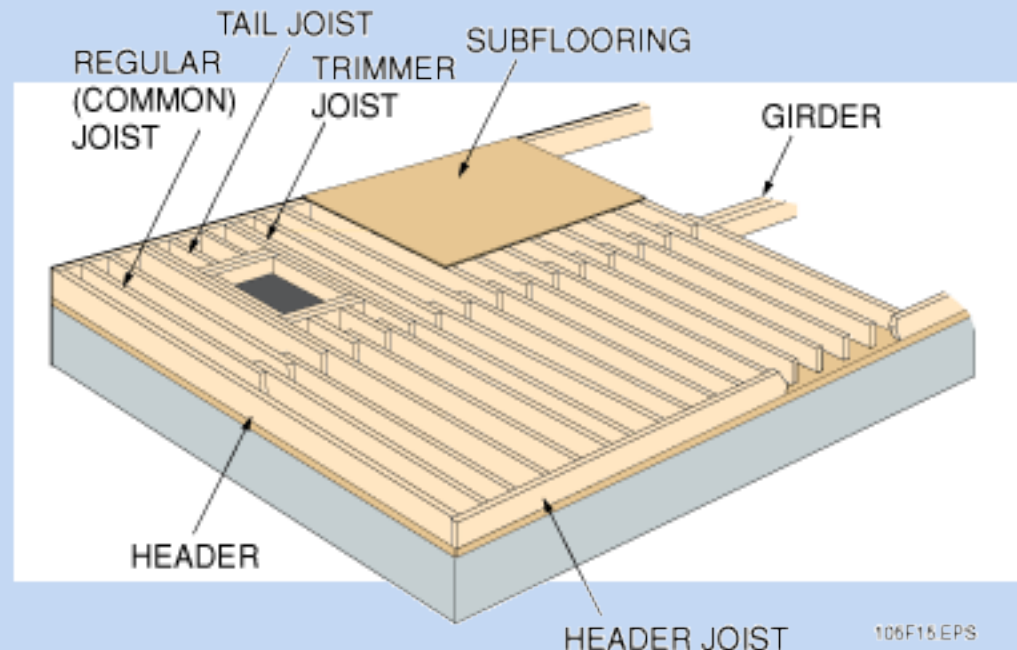
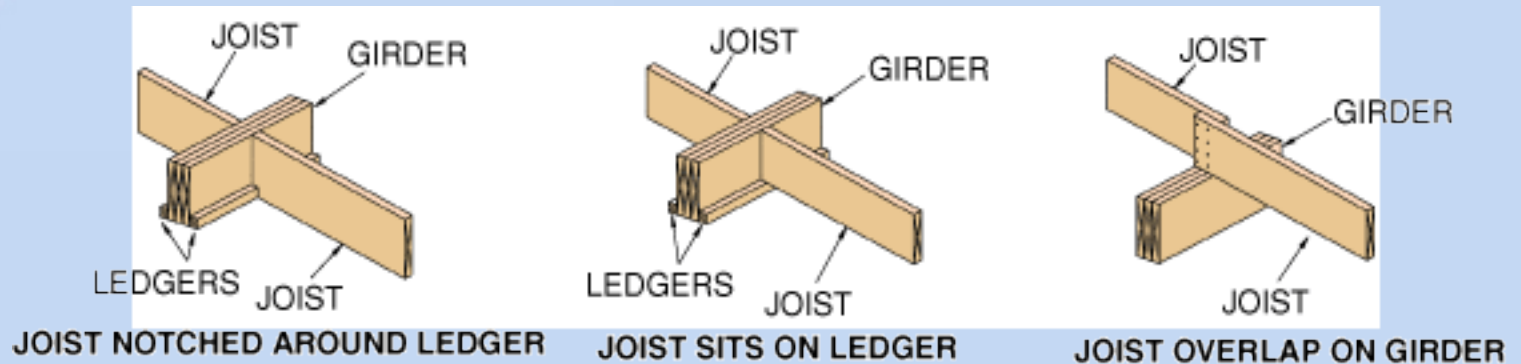


Figure 15 Floor joists.

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4.0.0 The Floor System

- There are three common methods for supporting joists at a girder. Local codes apply.



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Figure 16 Methods of joist framing at a girder.

SLIDE 19

4.0.0 The Floor System

- Joist hangers are also used to support joists at girders.
- Joists must be doubled to support extra loads such as whirlpool tubs. Joists under partitions and around floor openings must also be doubled.
- Spacing may be required between doubled joists to accommodate plumbing.

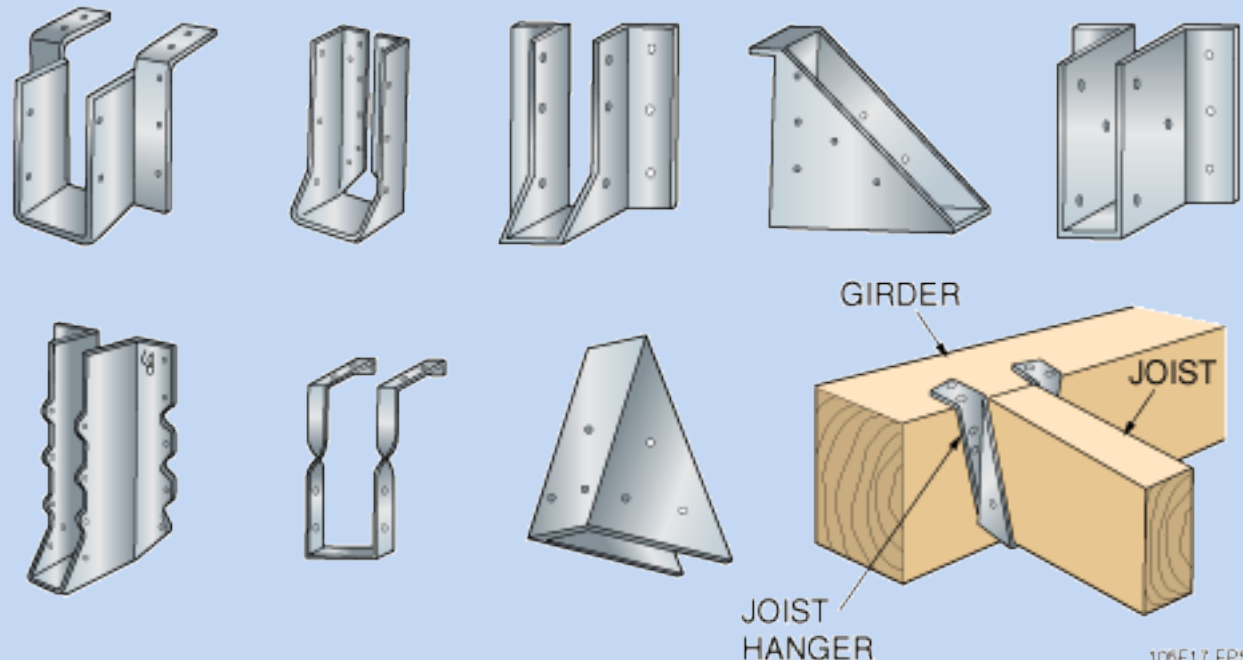


Figure 17 Typical types of joist hangers.

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4.0.0 The Floor System

- Building codes restrict drilling and notching of joists because the load-carrying capacity can be affected.

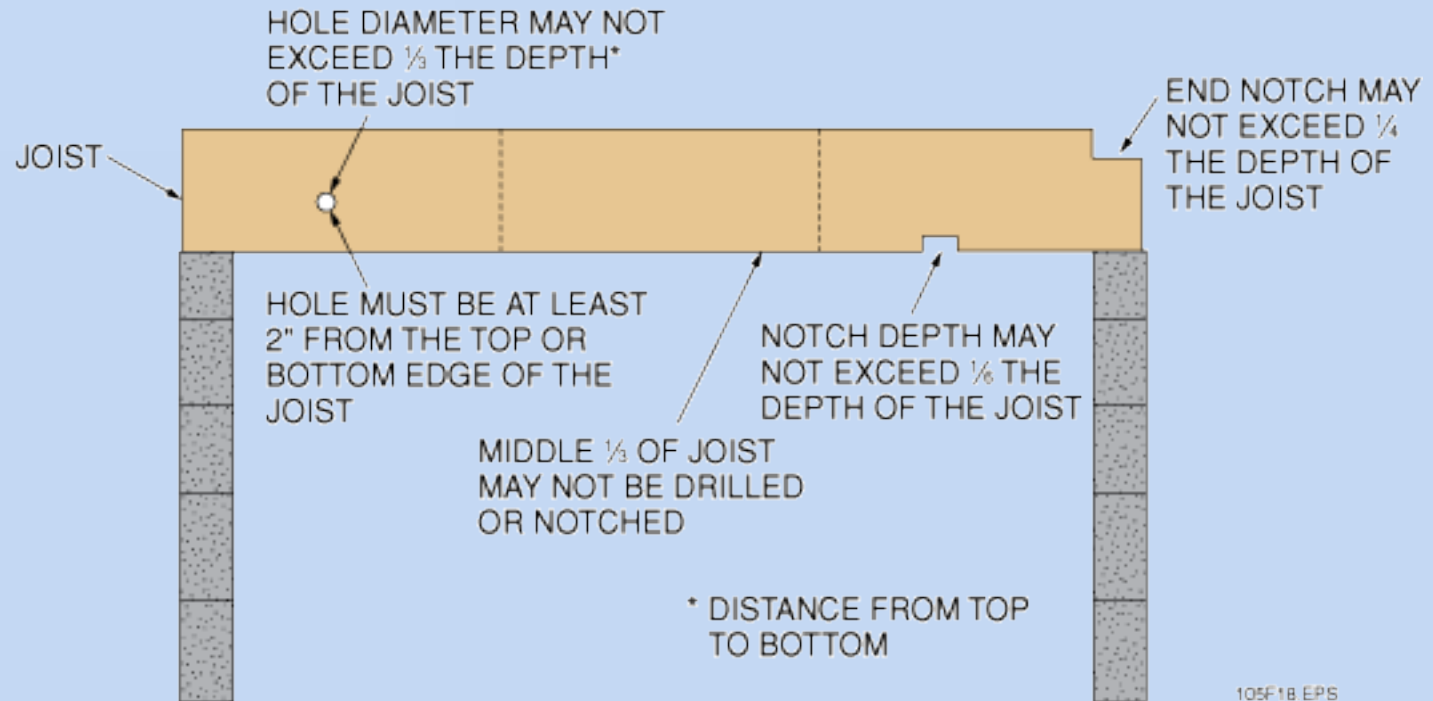


Figure 18 Notching and drilling of wooden joists.

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4.0.0 The Floor System

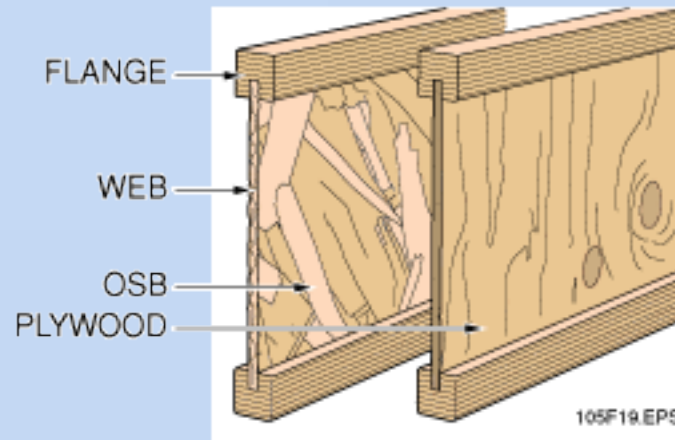


Figure 19 I-beams.

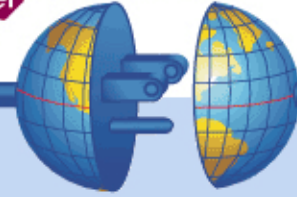
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4.0.0 The Floor System

- Wood I-beams are sometimes used for joists. The flanges of these beams may not be notched or drilled under any circumstances.



Figure 20 Typical floor system constructed with engineered I-beams (second floor shown).



End of Presentation